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ABSTRACT

The image of the instructional program in vocational agriculture must be changed to reflect a scientific and futuristic nature. The future of vocational agriculture depends upon a willingness of the agricultural education profession to analyze current programs and adjust them to meet the changes of today's rapidly advancing biotechnology and information technology. Technological gains already achieved or just over the horizon include computerized monitoring, gene manipulation, robots, and computerized control of farm systems. Information technologies are predicted to reduce barriers for entry into production agriculture and to increase marketing efficiency. Basic plant and animal research, food and fiber processing, and agribusiness management and marketing are expected to provide the most significant employment opportunities. In contrast, graduates seeking positions in production agriculture, agricultural education, and agricultural communications will encounter strong competition for limited employment opportunities. Supervised occupational experience programs, Future Farmers of America, laboratory experiences, classroom instruction, and adult education must all be modernized to reflect this new image. A balanced combination of the traditional and a newly developed futuristic program of vocational agriculture must then be effectively marketed. (YLB)

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Adjustments Needed in Vocational Agriculture Programs to Meet the Employment Needs of the Food and Fiber System in the Next Decade

A Position Paper

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FOREWORD

Vocational agriculture has been a part of the voluntary offerings of the public schools for many years. The growth of vocational agriculture in the public schools was given its initial push by the Smith-Hughes Act of 1917 and the subsequent federal acts.

As we have moved into an information age which places greater emphasis upon skills and technical knowledge, we find renewed emphasis in vocational agriculture programs.

This position paper provides an explanation of the adjustments needed in vocational agriculture programs to meet the employment needs of the food and fiber system in the next decade. It is hoped that educational policymakers at all levels will give additional consideration to vocational agriculture programs upon their perusal of this document.

Appreciation for the development of this position paper is extended to all members of NASAE and, more specifically, to the 1986 and 1987 Executive Committee of NASAE.

Dewey W. Stewart
President, NASAE

Adjustments Needed in Vocational Agriculture Programs to Meet the Employment Needs of the Food and Fiber System in the Next Decade

Introduction

Approximately 25 percent of the national work force are employed in the field of agriculture; 2 to 3 percent of the population are directly involved in farming. This 25 percent includes those working in occupations related to food and fiber production, transportation, processing, packing, storing, advertising, distributing, and other activities associated with food, clothing, and shelter. These jobs are numerous and diverse, but each contributes and strengthens the link between farm products and the restaurant, grocery store, and dinner table.

An expected increase in American agricultural productivity will offset losses of cropland due to erosion, urban development, and water quality and scarcity. This surge in productivity will be the result of accelerated mechanization and breakthroughs in genetic engineering. American farms - fewer, larger, employing fewer people, and using less water - will continue to produce more food than this country can consume. There will be a surplus for export, but the demand for this surplus will be unpredictable among countries that will also be experiencing productivity gains. Commodity prices will likely remain low, slowing the rate of inflation.

Emerging Technologies and the Future of Agriculture

Biotechnology and information technology have the potential to significantly increase agricultural yields. Economists predict that immediate impacts of these technologies will be felt first in animal production. Through embryo transfers, gene insertion, growth hormones and other genetic engineering techniques, dairy cows will produce more milk per cow, and cattle, swine, sheep and poultry will produce more meat per pound of feed.

Impacts on plant production are predicted to take longer - almost the remainder of the century. However, by that time it is predicted that technical advances will allow some crops to be altered genetically for disease and insect resistance, higher production of protein, and self-production of fertilizer and herbicide.

Other technological gains already achieved or just over the horizon include:

- Computerized monitoring of crops, livestock, and operations through the use of remote sensors.
- Gene manipulation to produce bigger, healthier, and more productive livestock, grains, fruits, and vegetables.
- Manipulated microbes to neutralize chemical contamination, fight crop diseases, fertilize the soil, and prevent plant freezing.
- Remote-controlled robots, including tractors and other farm machinery, to till the fields via computer programs.
- Computerized control of farm systems, such as ventilation, irrigation, livestock feeding, and sanitation.

Also predicted are information technologies to reduce barriers for entry into production agriculture and to increase marketing efficiency. New technology is expected to substantially reduce the land and water requirements for meeting future agricultural needs.

Basic plant and animal research, food and fiber processing, and agri-business management and marketing are expected to provide the most significant employment opportunities for graduates with expertise in agriculture, natural resources, and veterinary medicine. In contrast, during the next several years, graduates seeking positions in production agriculture, agricultural education, and agricultural communications will encounter strong competition for limited employment opportunities within the U.S. food and fiber system.

Adjustments Needed for Vocational Agriculture

The vocational agriculture program in this country must adjust to meet the needs of the emerging agricultural industry. Vocational agriculture should become involved in technological advancement and present itself as a dynamic and changing educational delivery system that is on the cutting edge of progress in the agricultural industry. Objectives should be established to update the instructional program with emphasis on agri-science skills. These skills should be developed through both traditional and innovative teaching approaches including experiential activities, leadership development, problem solving, and other applied techniques.

Efforts must be intensified to recruit top students for training as teachers of agriculture. Departments of agricultural education must prepare a brighter, more motivated, computer-literate teacher who believes the job is more important than winning contests and producing grand champions.

Modifications of traditional supervised occupational experience programs may be needed. For example, a student who desires to become employed in international agriculture may need to receive supervised occupational experience program credit in an entirely different manner than would the traditional production agriculture or agribusiness student. It may be necessary to quantify experiences in agriculture in terms other than dollars earned and hours worked.

Adjustments in vocational agriculture programs must include the development of the individual student in the acquisition of:

- Personal skills and attitudes.
- Communication and computational skills and technological literacy.
- Employability skills.
- Broad agricultural concepts, specific occupational skills, and knowledge to form foundations for career planning and lifelong learning.
- An understanding of the role and importance of international agriculture and agri-marketing.

There must be a closer working relationship between the academic community and professionals within agricultural education to support the acquisition and reinforcement of basic skills.

Courses of study and curricula must be developed that relate to agriculture through the application of biology, chemistry, physiology, mathematics, engineering, communication and computation. With input from teachers, curricula should be developed based on competencies identified by agricultural business and industry. Articulation models between secondary, postsecondary, and adult areas of agricultural education should also be developed.

Summary

The image of the instructional program in vocational agriculture must be changed to reflect a scientific and futuristic nature. Supervised occupational experience programs, FFA, laboratory experiences, classroom instruction, and adult education must all be modernized to reflect this new image. A balanced combination of the traditional and a newly developed futuristic program of vocational agriculture must then be effectively marketed to students; parents; business and industry; teachers; local, state, and federal agencies; and the general public. The future of vocational agriculture depends upon a willingness of the agricultural education profession to critically analyze current programs and to adjust them to meet the changes of today's rapidly advancing biotechnology and information.